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EVALUATION OF LANDSAT-2 DATA

FOR

SELECTED HYDROLOGIC APPLICATIONS

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Landsat-2 Investigation No. 23170

Contract No. NAS-53991A

23170

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A. Problems

None

B. Accomplishments

1. Computer-enhanced (DMD) prints and the corresponding rectified microfilm (full resolution) obtained for April 17, 1975 Landsat pass over Cranberry Lake. Rectified microfilm accomplished by using the "nearest neighbor" technique that chooses 32 of 44 or 45 spots to fill each scan line for a given frame. The result is a frame whose orthogonal dimensions are equal. Similar prints and microfilm have been generated for the Sierra snow studies involving density and runoff.

2. Snow maps of three river basins (Pilot Creek, Duncan Creek and the North Fork of the Middle Fork of the American River), sub-basins of the American River basin, have been prepared and planimetered for 1973, 1975, and 1976. These basins were selected because of the absence of storage or diversions above the gaging stations. The basins will be used in the study of snowmelt versus runoff. Microfilm printouts assembled at a scale close to 1:24,000 permit direct comparison with U.S.G.S. 7 1/2-minute quadrangles.

3. Computer-enhanced (DMD) prints produced for Luverne test site from Landsat tapes dated 3/30/75, 5/11/75, and 10/1/75.

4. Final γ -ray report on Luverne, Minnesota test site received from EG&G. The ^{40}K and ^{208}Tl photopeak area methods gave average soil moisture values of 32% and 28%, respectively. The gross count rate method gave an average soil moisture value of 28%, with mile-by-mile values ranging from 21% to 36%. Ground truth soil moisture values

ranged from 23% to 39% with the average value being 28%. The three methods of surveying soil moisture by γ -ray give results consistent with those obtained by ground truth.

5. Final review of EG&G γ -ray report Phoenix, Arizona test site completed. Published report due shortly. Results show that the ^{40}K and ^{208}Tl photopeak area methods gave average soil moisture values of 22% and 20%, respectively. The gross count method gave an average soil moisture of 21%, with mile-by-mile values ranging from 14% to 33%. Ground truth soil moisture values ranged from 8% to 32%, with the average value being 23%. The photopeak method appears useful to measure the long-line soil moisture average and the gross count rate method can be used to measure soil moisture in one mile or smaller increments.

C. Significant Results

None

D. Publications

None

E. Recommendations

None

F. Funds Expended

None

G. Data Used

CCT's used to produce enhanced images and microfilm of Luverne, Minnesota, Cranberry Lake, New York, and the American River basin, California.

